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4 2021 Colorado Law Enforcement Officer of the Year (MADD/CDOT) 2024 Denver Police Department Officer of the Year
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Making the Call:
Using Experience to Complement Training
Aaron Botts, Corporal

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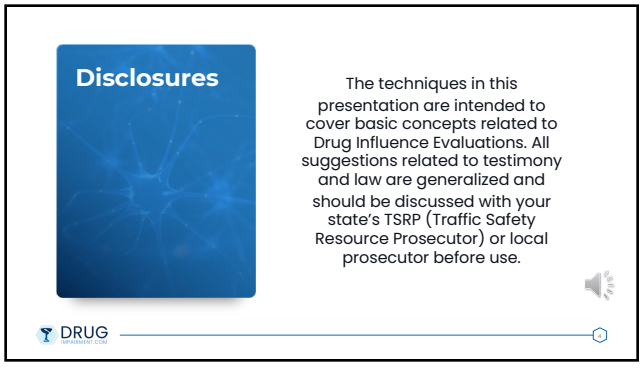
Disclosures
The techniques in this presentation are intended to cover basic concepts related to Drug Influence Evaluations. All suggestions related to testimony and law are generalized and should be discussed with your state's TSRP (Traffic Safety Resource Prosecutor) or local prosecutor before use.
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Learning Objectives

1. Participants will be able to recognize different types of reasoning and explain their relevance in DRE evaluations.
2. Participants will learn to evaluate the credibility of sources by understanding and applying specific criteria for evaluation.

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Learning Objectives

3. Participants will apply the credibility evaluation process to actual publications, enhancing their ability to discern reliable information.
4. Participants will identify anomalous Drug Influence Evaluations and apply their foundational knowledge and experience to accurately assess these evaluations.

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Overview of Course

Part 1: Introduction & Reasoning in DRE Evaluations

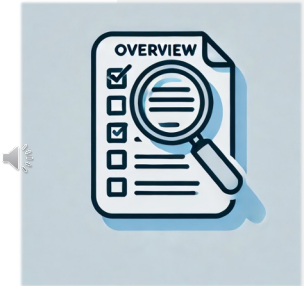
Overview of training
Types of Reasoning

Part 2: Leveraging Experience and Lifelong Learning

Experience vs. Foundational Knowledge
Evaluating Sources

Part 3: Advanced Decision Making Beyond the Matrix

Applying training to real life scenarios
Matrix Anomaly 1 – DRE Manual
Matrix Anomaly 2 – Scientific Study



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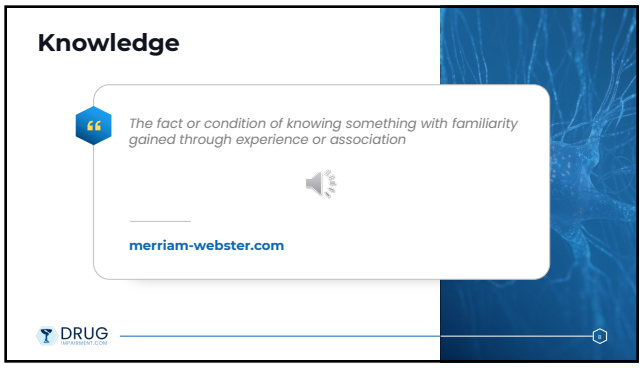
Knowledge
The fact or condition of knowing something with familiarity gained through experience or association
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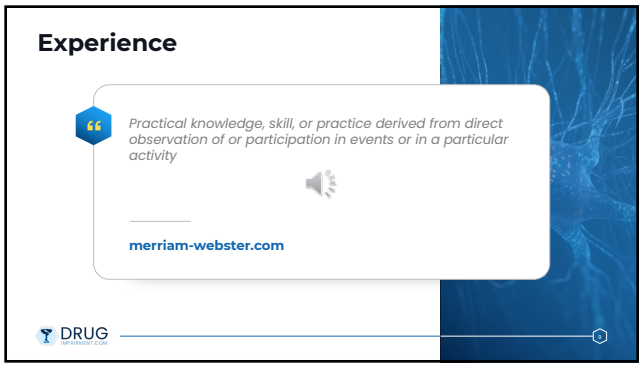
Experience
Practical knowledge, skill, or practice derived from direct observation of or participation in events or in a particular activity
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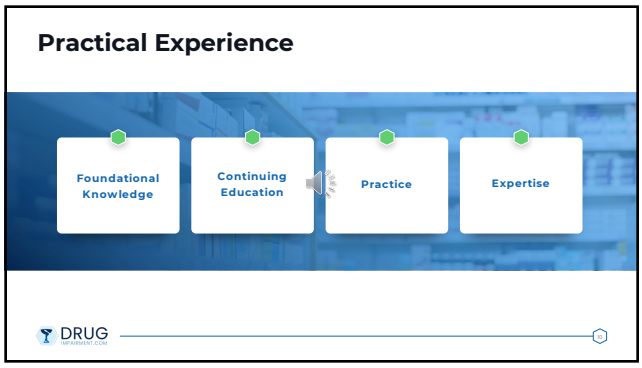
Practical Experience
Foundational Knowledge
Continuing Education
Practice
Expertise
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Cooking

Experienced Chefs

They develop the ability to create new dishes, understand the subtleties of flavor combinations, and make adjustments on the fly based on their foundational skills

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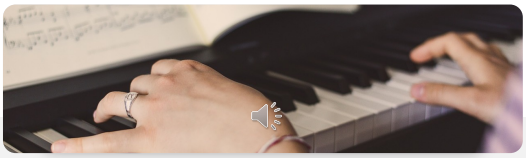
Music



Experienced Musicians

They learn to improvise, understand complex compositions, and develop their unique style. Their foundational knowledge of scales and chords remains crucial, but experience allows them to play intuitively and creatively.

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Law Enforcement

Experienced Officers

They build on foundational training through continuous learning and real-world experience. This integration of knowledge and practical insights allows them to detect subtler signs, adapt to complex situations, and make informed decisions with greater confidence and competence.

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Inference

a conclusion or opinion that is formed because of known facts or evidence.

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Reasoning in DRE Evaluations

Inference/Reasoning

Deductive Reasoning

Inductive Reasoning

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Reasoning in DRE Evaluations

Abductive Reasoning

Decompositional Reasoning

Fallacies

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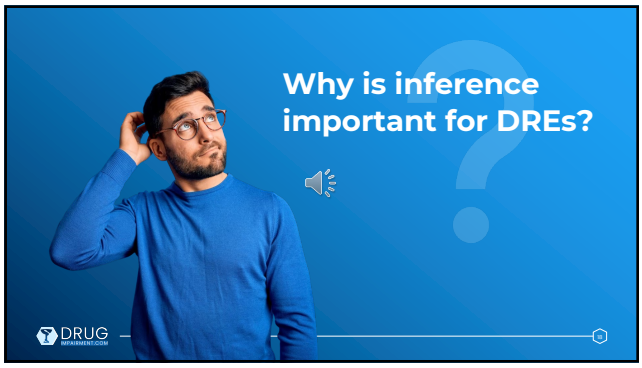

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Deductive Reasoning

All A are B.
C is A.
Therefore, C is B.

All humans are mortal.
Socrates is human.
Therefore, Socrates is mortal.

Validity

A deductive argument is valid if the conclusion logically follows from the premises.

Deductive Reasoning

Deductive reasoning is the process of drawing specific conclusions from general premises that are known or assumed to be true.

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Characteristics of Deductive Reasoning

Certainty: If the premises are true, the conclusion must be true.

Logical Necessity: The conclusion follows necessarily from the premises.

Objective: Provides clear and definitive answers when premises are accurate.

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Deductive Reasoning

- **Application:** Helps DREs make definitive conclusions based on established protocols and known effects of substances
- **Limitations:** Depends on the accuracy and completeness of the premises; new or unexpected evidence can challenge conclusions.
- **Example:** All "DID" drugs cause HGN (premise), the subject has HGN(observation), therefore, the subject is under the influence of a "DID" drug (conclusion).

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Inductive Reasoning

Some of A are B.
Therefore, all of A are B.

This lake has swans that are white.
Therefore, all swans are white.

Probability

Inductive conclusions are probable but not certain, based on the strength of the evidence.

Inductive Reasoning

Inductive reasoning involves making generalizations based on specific observations or instances.

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Characteristics of Inductive Reasoning

- **Flexibility:** Allows for conclusions to be revised with new evidence.
- **Practicality:** Useful in real-world scenarios where complete information is not available.
- **Uncertainty:** Conclusions are not guaranteed to be true but are supported by evidence.

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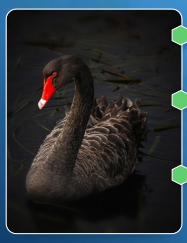
Inductive Reasoning



Application: Helps DREs make informed generalizations from observed signs and symptoms.

Limitations: Conclusions can be false if the observed instances are not representative or sufficient.

Example: If multiple subjects showing specific signs test positive for a drug, a new subject with similar signs might be under the same influence.

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Abductive Reasoning

A is observed
B is not observed but is the most likely cause of A.
Therefore, B likely occurred.

The street was dry when you went to sleep and wet when you awoke.
Therefore, it likely rained while you were asleep.

Process
Seeks the best explanation among possible hypotheses.

Abductive Reasoning

Abductive reasoning involves inferring the most likely explanation for a set of observations.

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Structure of Abductive Arguments

Observation: Identify surprising facts or anomalies

Hypothesis: Generate potential explanations.

Best Explanation: Select the hypothesis that best accounts for the observations.

Example:
• Observation: Subject has red eyes and dilated pupils.
• Hypothesis 1: The subject might be under the influence of cannabis.
•Hypothesis 2: The subject might be suffering seasonal allergies and have pink eye.

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Characteristics of Abductive Reasoning

Best Guess: Provides the best possible explanation based on available information.

Flexibility: Allows for new hypotheses with additional evidence.

Uncertainty: The chosen explanation is the most likely, but not certain.

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Abductive Reasoning

Application: Helps DREs form hypotheses about drug influence based on observed symptoms.

Limitations: Conclusions are not definitive and depend on the quality and completeness of the observations.

Benefits: Useful for generating hypotheses, dealing with incomplete information, and making educated guesses.

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Decompositional Reasoning

Identify the whole problem
Decompose it into its constituent parts
Analyze each part independently
Synthesize the parts to understand the whole

IT Help

Outcome
By breaking down the problem into individual components and analyzing each, you effectively diagnose and resolve the issue.

Decompositional Reasoning

Decompositional reasoning involves breaking down a complex problem or observation into simpler, more manageable parts for individual analysis.

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Characteristics of Decompositional Reasoning

Analytical Depth: Provides a detailed understanding of each component.

Systematic Approach: Ensures no aspect of the evaluation is overlooked.

Holistic Understanding: By analyzing the parts, a deeper insight into the whole situation is achieved.

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Decompositional Reasoning – Benefits/Challenges

Clarity: Simplifies complex problems by breaking them down.

Thoroughness: Ensures all aspects of a situation are considered.

Complexity: Understanding relationships between parts can be difficult.

Over-Simplification: Risk of missing the bigger picture by focusing too much on individual components.

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Decompositional Reasoning

Indicators Consistent with Drug Categories

	CNS DEPRESSANTS	CNS STIMULANTS	HALLUCINOGENS	DISSOCIATIVE ANESTHETICS	NARCOTIC ANALGESICS	INHALANTS	CANNABIS
HGN	Present	None	None	Present	None	Present	None
VGN	Present (High Dose)	None	None	Present	None	Present (High Dose)	None
LOC	Present	None	None	Present	None	Present	Present
Pupil Size	Normal (1)	Dilated	Dilated	Normal	Constricted	Normal (4)	Dilated (6)
Reaction to Light	Slow	Slow	Normal (3)	Normal	Little or None Visible	Slow	Normal
Pulse Rate	Down (2)	Up	Up	Up	Down	Up	Up
Blood Pressure	Down	Up	Up	Up	Down	Up/Down (5)	Up
Body Temperature	Normal	Up	Up	Up	Down	Up/Down/Normal	Normal
Muscle Tone	Flaccid	Rigid	Rigid	Rigid	Flaccid	Normal or Flaccid	Normal

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Fallacies

Formal Fallacy

"Murphy's Law"
Something can go wrong. (premise)
Therefore, it will go wrong. (invalid conclusion)

Informal Fallacy

Inductive conclusions are probable but not certain, based on the strength of the evidence.

Impact

Can lead to false conclusions and mislead the evaluation process.

Fallacies

Fallacies are errors in reasoning that undermine the logic of an argument.

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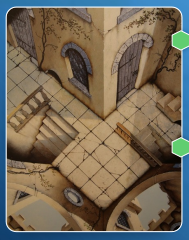
Common Fallacies



Hasty Generalization: Concluding that all individuals with bloodshot eyes are under the influence of cannabis based on a few cases. This ignores other potential causes like fatigue or allergies.

False Dilemma: Assuming that a subject must be either impaired by drugs or suffering from a medical condition, without considering the possibility that they are not impaired at all.

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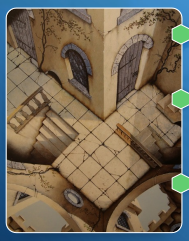
Common Fallacies



Circular Reasoning: "This person is under the influence of drugs because they have dilated pupils, and they have dilated pupils because they are under the influence of drugs."

Appeal to Authority: Accepting the conclusion that a person is under the influence just because an authoritative figure (e.g., a senior officer) says so, without considering the actual evidence.

Awareness: Recognizing common fallacies helps prevent faulty conclusions.

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Reasoning in Practice

- **Some Cannabis-only subjects displayed HGN**
  This was supported by tox reports
- **Therefore, Cannabis causes HGN**

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Which type of reasoning is this?

- **Deductive**
- **Inductive**
- **Abductive**
- **Decompositional**
- **Logical Fallacy**

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Reasoning in Practice

- **All Narcotic Analgesics cause pupillary constriction.**
- **Chris has constricted pupils in all 3 lighting conditions.**
  And he is an otherwise healthy adult.
- **Therefore, Chris is under the influence of a Narcotic Analgesic**

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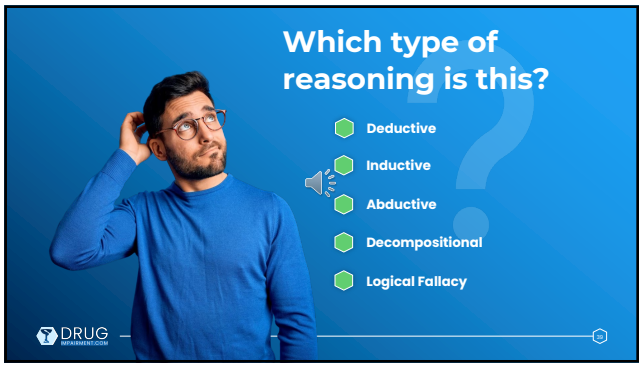
Which type of reasoning is this?
Deductive
Inductive
Abductive
Decompositional
Logical Fallacy
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Reasoning in Practice
Clinical Indicators
LOC present, Dilated pupils, Elevated Pulse and BP.
General Indicators
Eyelid and Body tremors, Impaired memory, Increased appetite, relaxed inhibitions, and poor performance on divided attention tests.
A DRE can call a category
While many indicators are found in multiple categories, a strong inference can be made to one category.
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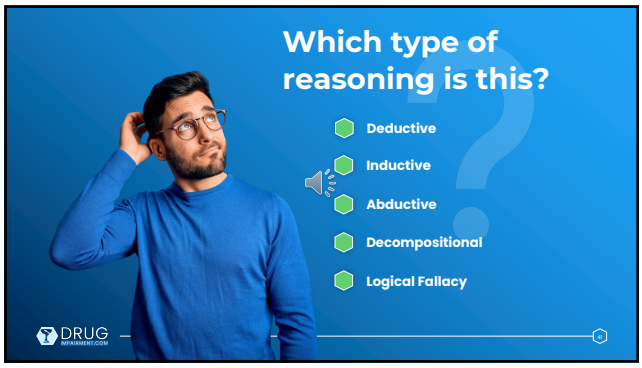
Which type of reasoning is this?
Deductive
Inductive
Abductive
Decompositional
Logical Fallacy
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Reasoning in Practice

- **Clinical Indicators**
  Dilated pupils, elevated pulse, low blood pressure, high body temp.
- **General Indicators**
  Dizziness, dazed appearance, Nausea, sweating, confused, disoriented, very poor performance on divided attention tests.
- **DRE Call**
  Hallucinogen & Inhalant

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Which type of reasoning is this?

- Deductive
- Inductive
- Abductive
- Decompositional
- Logical Fallacy

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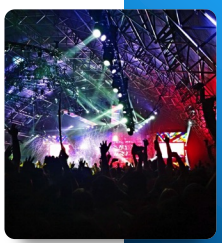
Reasoning in Practice

- **Molly is under the influence and among other things, has HGN and constricted pupils.**
- **There are no general indicators of inhalant use or medical complaints.**
- **Molly is likely under the influence of at least 2 drug categories**



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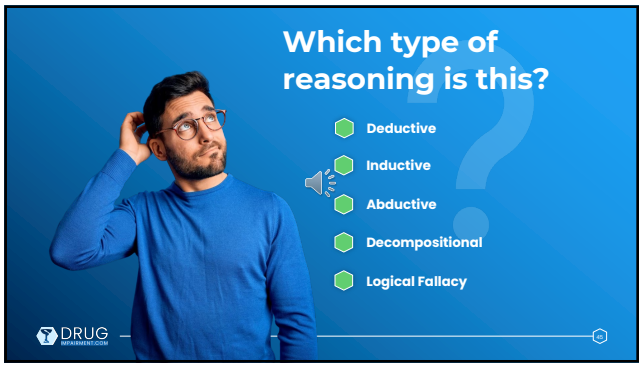

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The DRE Matrix

Indicators Consistent with Drug Categories

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Blood Pressure	Down	Up	Up	Up	Down	Up/Down (5)	Up
Body Temperature	Normal	Up	Up	Up	Down	Up/Down/Normal	Normal
Muscle Tone	Flaccid	Rigid	Rigid	Rigid	Flaccid	Normal or Flaccid	Normal

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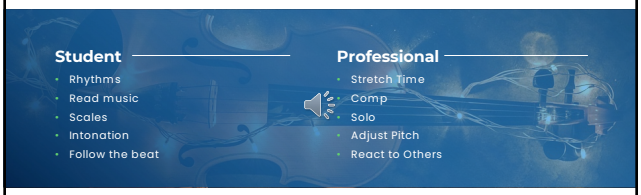
Musician



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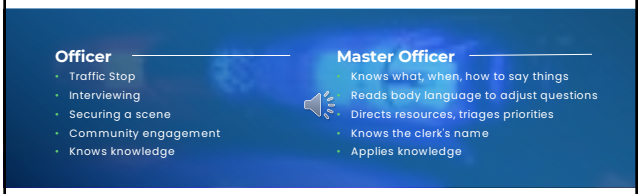
Law Enforcment Officer



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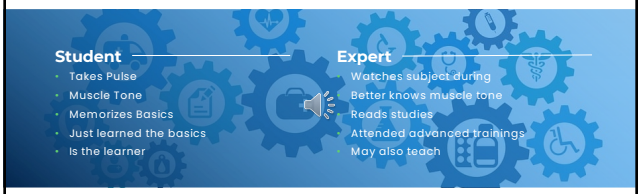
Drug Recognition Expert



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Sources

Credibility
The degree to which a source can be trusted. This refers to the trustworthiness and reliability of the sources, data, and findings presented in the work.

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Criteria for Evaluating Sources

Ask

- Author's Background
- Purpose & Objective
- Funding & Sponsorship
- Publication Source
- Peer Review Status
- Bias & Objectivity
- Methodology
- Evidence & Data Quality
- Consistency & Replicability
- Clarity & Transparency
- Relevance & Timeliness
- Ethical Considerations
- Impact & Citations
- Author's Affiliation
- Intended Audience

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The Five Ws

WHO	is the author of the source?	• published the source? • Are they experts?
WHAT	is the purpose of the information source?	• Selling something? • Persuading? • Informing?

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Type Your Headline Here

WHEN	Was the source created?	• Has it been updated?
WHERE	Can I verify the information?	• Look for date of publication.
WHY	Would I use this source instead of another?	• Scope • Perspective

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Evaluating this information

WHO
LibreTexts is a reputable educational platform whose authors are educators and experts.

WHAT
The content is well-researched, providing clear criteria for evaluating sources.

WHEN
The webpage is regularly updated and this article is from June of 2024.

WHERE
The information is hosted on large, trusted, educational website, freely accessible.

WHY
To educate readers targeting students and professionals.

Citation
Libretexts. (2024, June 28). *5.3: Evaluating for Credibility*. Humanities LibreTexts. https://human.libretexts.org/Courses/Coalinga_College/Critical_Thinking%3A_Argumentative_Reading_and_Writing_(CID_ENGL105)/05%3A_Research_Methods_and_Sources/5.03%3A_Evaluating_for_Credibility

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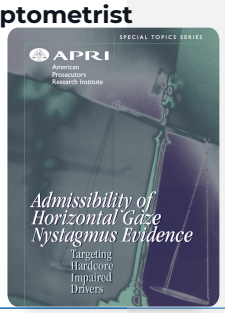
HGN and the Role of the Optometrist

WHO
This section, written by Karl Citek, OD, PhD, FAAO, from Pacific University College of Optometry.

The American Prosecutors Research Institute (APRI), a well-respected organization associated with the National District Attorneys Association, published this monograph.

WHAT
Discusses the scientific validity and reliability of the HGN test, particularly emphasizing the role of optometrists in validating the test to support the admissibility of HGN evidence in court by providing a thorough scientific and legal foundation for the test.



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HGN and the Role of the Optomotrist

WHEN

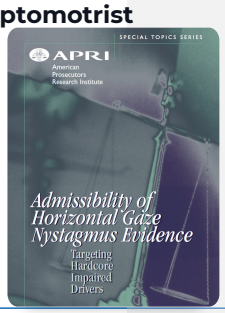
May 2003, with a production date of April 3, 2003.

There is no indication of updates since the original publication date.

WHERE

Available through the American Prosecutors Research Institute and can be accessed online via their website. It is also supported by references to other scientific studies and legal cases.

The credibility of the source is reinforced by the extensive citations and references to scientific research and legal precedents.



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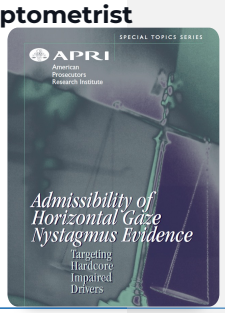
HGN and the Role of the Optometrist

WHY

Relevant for those involved in law enforcement, legal proceedings related to DUI cases, and those interested in the scientific validation of field sobriety tests.

The purpose of using this source over others is its detailed focus on the HGN test, including scientific explanations, legal implications, and practical applications.



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HGN and the Role of the Optometrist

Key Points for Experts

- Optometrists
- The American Optometric Association
- HGN test supported
- Proper administration

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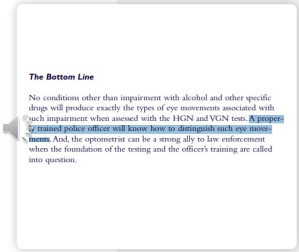
Admissibility of HGN Evidence

American Prosecutors Research Institute

May 2003
HGN and the Role of the Optometrist
Karl Citek, OD, PhD, FAAO

Training & Experience

Jerk nystagmus
Pendular nystagmus
Saccadic Intrusion



The Bottom Line

No conditions other than impairment with alcohol and other specific drugs will produce exactly the types of eye movements associated with such impairment when assessed with the HGN and VGN tests. A properly trained police officer will know how to distinguish such eye movements. And, the optometrist can be a strong ally to law enforcement when the foundation of the testing and the officer's training are called into question.

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Summary

- Robust Scientific Foundation
- Eye Movements
- Enhances Proficiency
- Ongoing Education

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Which is not a key factor when evaluating the credibility of an author?

- Credentials
- Expertise
- Writing style and grammar
- Affiliations
- Publication history

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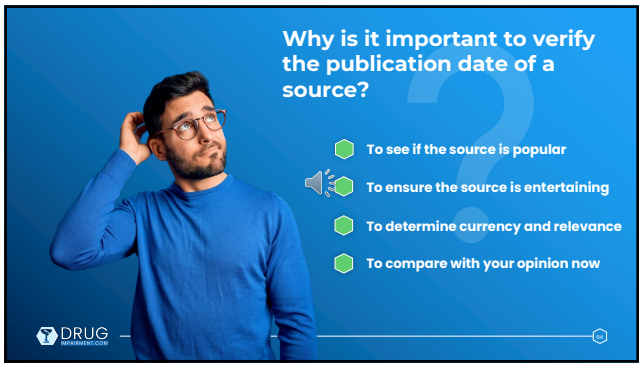
Why is it important to verify the publication date of a source?
To see if the source is popular
To ensure the source is entertaining
To determine currency and relevance
To compare with your opinion now
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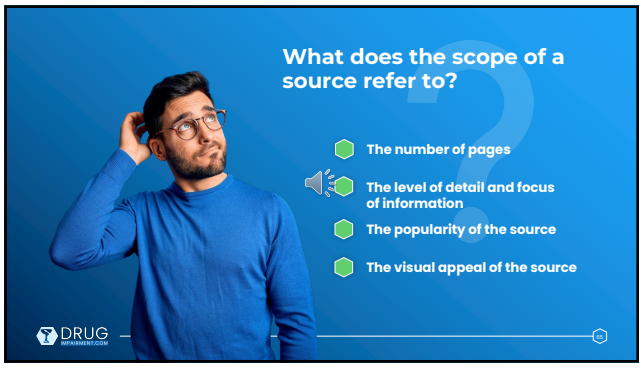
What does the scope of a source refer to?
The number of pages
The level of detail and focus of information
The popularity of the source
The visual appeal of the source
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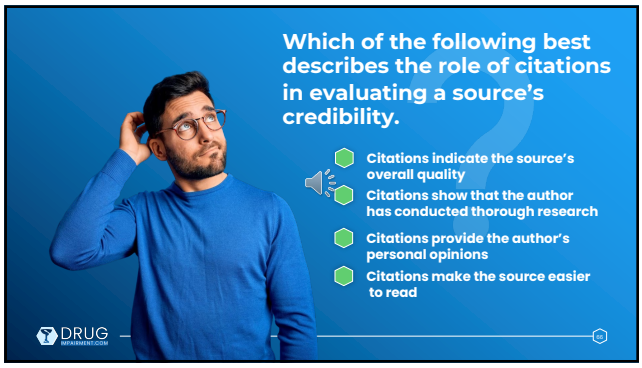
Which of the following best describes the role of citations in evaluating a source's credibility.
Citations indicate the source's overall quality
Citations show that the author has conducted thorough research
Citations provide the author's personal opinions
Citations make the source easier to read
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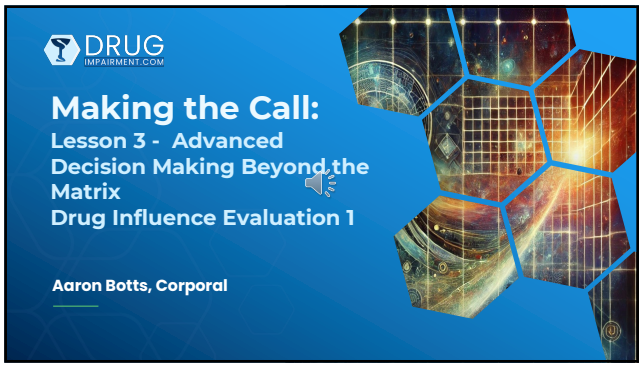
DRUG
IMPAIRMENT.COM
Making the Call:
Lesson 3 - Advanced Decision Making Beyond the Matrix
Drug Influence Evaluation 1
Aaron Botts, Corporal

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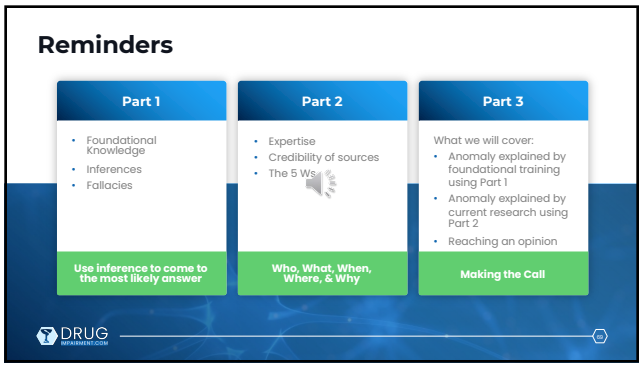
Reminders
Part 1
Foundational Knowledge
Inferences
Fallacies
Use inference to come to the most likely answer
Part 2
Expertise
Credibility of sources
The 5 Ws
Who, What, When, Where, & Why
Part 3
What we will cover:
Anomaly explained by foundational training using Part 1
Anomaly explained by current research using Part 2
Reaching an opinion
Making the Call
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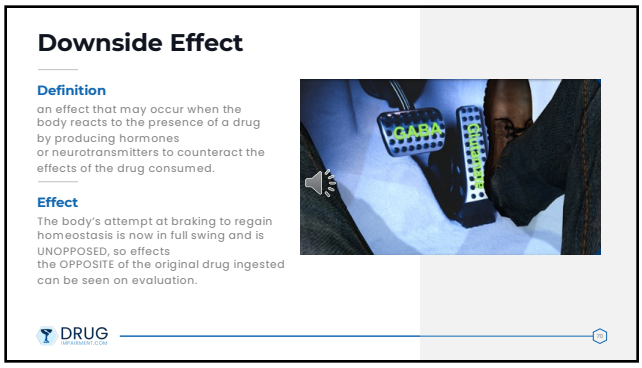
Downside Effect
Definition
an effect that may occur when the body reacts to the presence of a drug by producing hormones or neurotransmitters to counteract the effects of the drug consumed.
Effect
The body's attempt at braking to regain homeostasis is now in full swing and is UNOPPOSED, so effects the OPPOSITE of the original drug ingested can be seen on evaluation.
GABA
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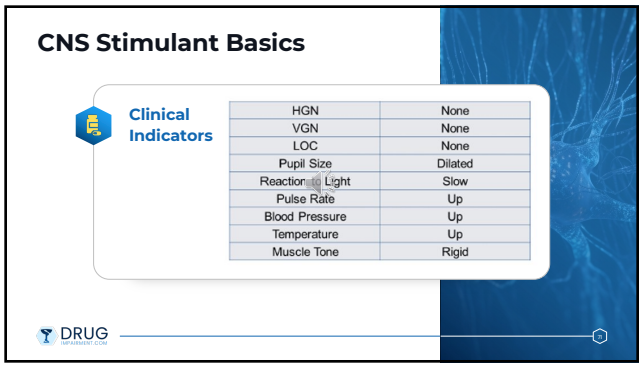
CNS Stimulant Basics
Clinical Indicators
HGN None
VGN None
LOC None
Pupil Size Dilated
Reaction to Light Slow
Pulse Rate Up
Blood Pressure Up
Temperature Up
Muscle Tone Rigid
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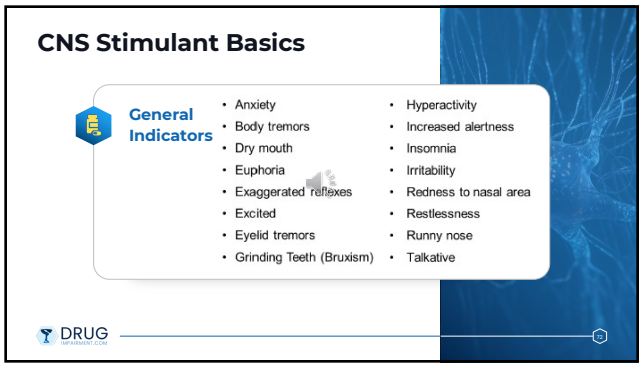
CNS Stimulant Basics
General Indicators
Anxiety
Body tremors
Dry mouth
Euphoria
Exaggerated reflexes
Excited
Eyelid tremors
Grinding Teeth (Bruxism)
Hyperactivity
Increased alertness
Insomnia
Irritability
Redness to nasal area
Restlessness
Runny nose
Talkative
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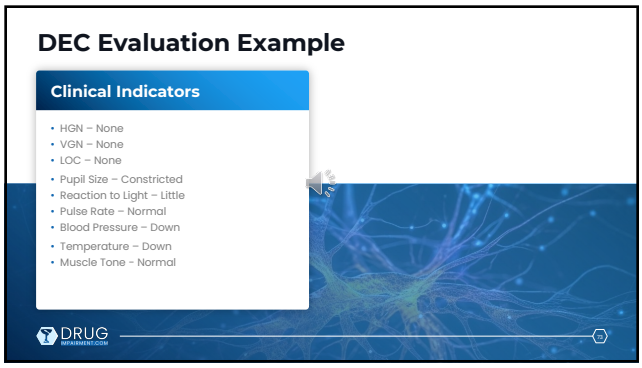
DEC Evaluation Example
Clinical Indicators
HGN – None
VGN – None
LOC – None
Pupil Size – Constricted
Reaction to Light – Little
Pulse Rate – Normal
Blood Pressure – Down
Temperature – Down
Muscle Tone - Normal
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DEC Evaluation Example

General Indicators

- Body Tremors
- Dry Mouth
- Drowsiness
- Slowed Reflexes

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Application of Decompositional Reasoning

DRE Matrix

- HGN, VGN, LOC – None
- Pupil Size – Constricted
- Reaction to Light – Little
- Pulse Rate – Normal
- Blood Pressure – Down
- Temperature – Down
- Muscle Tone - Normal

General Indicators

- Body Tremors
- Dry Mouth
- Drowsiness
- Slowed Reflexes

	NARCOTIC ANALGESICS
HGN	None
VGN	None
LOC	None
Pupil Size	Constricted
Reaction to Light	Little or None Visible
Pulse Rate	Down
Blood Pressure	Down
Body Temperature	Down
Muscle Tone	Flaccid
General Indicators	Depressed Reflexes Difficulty concentrating Droopy eyelids Drowsiness Dry mouth Euphoria Itching Nausea "On the nod" Puncture marks Slow, low, raspy speech Slowed breathing Slow deliberate movements

The Individual Parts

By breaking down a complex observation into simpler, more manageable parts, the officer is of the opinion that the person is under the influence of a Narcotic Analgesic.

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DEC Evaluation Example

Clinical Indicators

- HGN – None
- VGN – None
- LOC – None
- Pupil Size – Constricted
- Reaction to Light – Little
- Pulse Rate – Normal
- Blood Pressure – Down
- Temperature – Down
- Muscle Tone - Normal

Clinical Indicators (Expanded)

- HGN, VGN, LOC – None
- Pupil Size:
  - Room Light – 2.0 mm
  - NTD – 2.5 mm
  - Direct – 2.0 mm
  - (pupillary unrest present)
- Reaction to Light – Little
- Pulse Rate – 88 bpm
- Blood Pressure – 116/56
- Temperature – 97.4
- Muscle Tone - Normal

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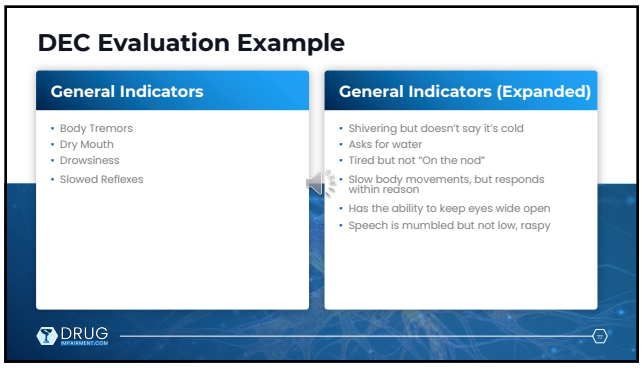
DEC Evaluation Example
General Indicators
Body Tremors
Dry Mouth
Drowsiness
Slowed Reflexes
General Indicators (Expanded)
Shivering but doesn't say it's cold
Asks for water
Tired but not "On the nod"
Slow body movements, but responds within reason
Has the ability to keep eyes wide open
Speech is mumbled but not low, raspy
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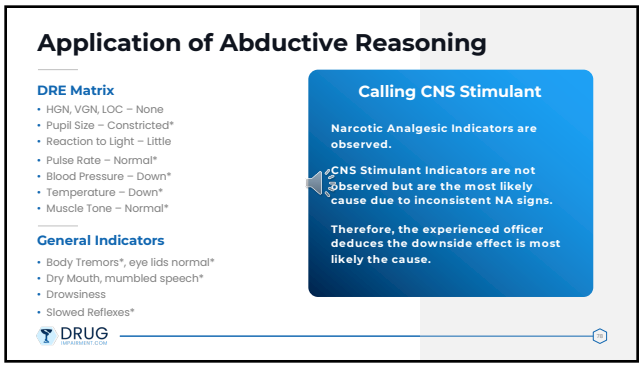
Application of Abductive Reasoning
DRE Matrix
HGN, VGN, LOC – None
Pupil Size – Constricted*
Reaction to Light – Little
Pulse Rate – Normal*
Blood Pressure – Down*
Temperature – Down*
Muscle Tone – Normal*
General Indicators
Body Tremors*, eye lids normal*
Dry Mouth, mumbled speech*
Drowsiness
Slowed Reflexes*
Calling CNS Stimulant
Narcotic Analgesic Indicators are observed.
CNS Stimulant Indicators are not observed but are the most likely cause due to inconsistent NA signs.
Therefore, the experienced officer deduces the downside effect is most likely the cause.
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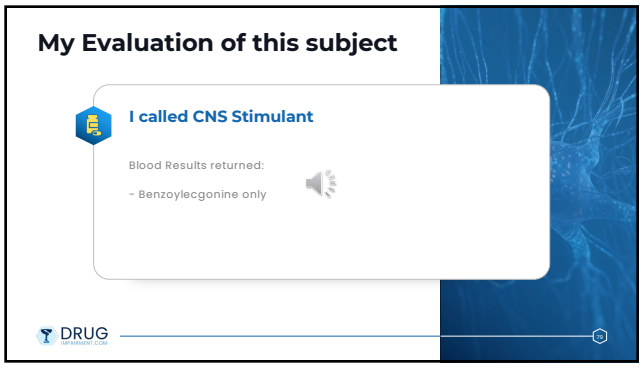
My Evaluation of this subject
I called CNS Stimulant
Blood Results returned:
- Benzoylecgonine only
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Credibility Analysis

A systematic review of oculomotor deficits associated with acute and chronic cannabis use

Citation

Manning, B., Downey, L. A., Narayan, A., & Hayley, A. C. (2023). A systematic review of oculomotor deficits associated with acute and chronic cannabis use. *Addiction Biology*. https://doi.org/10.1111/adb.13359

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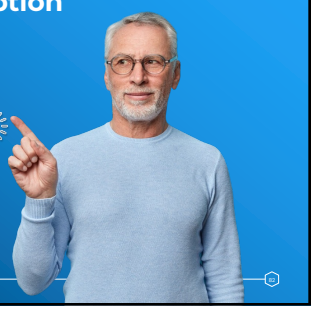
"Acute THC consumption selectively impacts oculomotor control, notably increasing saccadic latency and inaccuracy while impairing inhibitory control."



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Definitions

Selectively Impacts
Affects specific aspects of, rather than having a uniform effect

Acute THC consumption selectively impacts oculomotor control, notably increasing saccadic latency and inaccuracy while impairing inhibitory control.

Oculomotor Control
Ability to regulate eye movements and coordination of multiple eye muscles

Saccadic Latency
The delay between the appearance of a visual stimulus and the initiation of an eye movement

Saccadic Inaccuracy
Errors in the precision of saccadic eye movements

Inhibitory Control
Ability to suppress involuntary or unwanted eye movements

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Application of Conclusion

Long term users

Especially that began using early in life (14 – 16 YOA), display enduring deficits on visual scanning efficiency

Further Research necessary

But only to examine specifics in oculomotor control.

THC Affects Eye Movements

By integrating these findings into their assessments, DREs can make more accurate calls regarding cannabis impairment, even in the absence of typical matrix indicators like HGN.

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Author's Background and Expertise

Qualifications & Credentials

- Swinburne University of Technology
- The International Council for Alcohol, Drugs, and Traffic Safety
- Institute for Breathing and Sleep
- Psychopharmacology
- Neurobehavioral study experience

Recognition as Experts

- Recognized in the field of Psychopharmacology & Neurobehavioral study experience
- Authors are PhDs or PhD Candidates

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Purpose and Objective

Purpose of Research

- Effects of acute and chronic THC use on oculomotor control
- With emphasis on driving safety
- And use on roadside impairment tests

Specific Question/Problem

- How does THC impact oculomotor control?
- Can this be synthesized from prior studies to detect impairment?

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Funding and Sponsorship

Funding/Sponsoring Entity
- No grants were received from:
  - Public
  - Commercial
  - Not-for-profit

Conflict of Interest
- 3 of the 4 authors declare no conflicts of interest.
- 4th not mentioned.

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Publication Source

Where Published
- Addiction Biology
- Focus on neuroscience contributions
- Drug abuse/addiction
- Society for the Study of Addiction

Reputation
- Content geared towards:
  - Behavioral
  - Molecular
  - Genetic
  - Biochemical
  - Neuro-biological
  - Pharmacological
    - Animal experimentation
    - Clinical Research

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Peer Review Status

Peer Review
- Yes, through Addiction Biology publication

Quality & Validity
- This publication ensures high standards & quality.

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Bias and Objectivity

Evident Bias
- None indicated
- The study itself analyzes bias in included articles.

Acknowledgement of Potential Bias
- None indicated
- Low risk for Literature Review

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Methodology

Description & Appropriateness
- Systematic Review
- Synthesizing findings from multiple studies

Reliability & Validity
- Reliable and valid for summarizing evidence across studies

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Evidence and Data Quality

Sufficiency & Relevance
- Comprehensive and robust data
- The data supports the purpose
- Thorough documentation of references and sources

Credibility
- Various studies included reputable studies and institutions
- Peer-reviewed only

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Consistency and Replicability

Consistency
- Systematic Review
- Inconsistencies with DEC and nystagmus

Replicability
- Inclusion criteria and strategies clearly stated

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Clarity and Transparency

Clarity
- Clearly written
- Well-organized

Transparency
- Well documented references

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Relevance and Timeliness

Relevance to Current Knowledge
- Highly relevant

Recency and Applicability
- Published in 2023
- Applicable to impairment assessment

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Ethical Considerations

Ethical Conduct
- Not applicable

Ethical Approvals
- Not applicable

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Impact and Citations

Citations
- 1 Citation
- Published Dec. 2023
  - 6 months prior to this training

Impact on Field
- Significant

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Author's Affiliation

Institutional
- Swinburne University of Technology
- The International Council for Alcohol, Drugs, and Traffic Safety
  - Both reputable institutions

Institutional Reputation
- Swinburne University
  - Public Research University
  - Established 1908
  - Top 25 World's Best Young Universities
- ICADT
  - Independent
  - Not-for-profit body
  - International membership

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Intended Audience

Target Audience
- Academic
- Professional
- Researchers
- Policymakers
- Law Enforcement

Tailoring
- In-depth, scientifically valid information
  - Drug Recognition
  - Driving Safety Assessments

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Evaluating this publication

WHO
The author's have established authority in the field and are published by a reputable source.

WHAT
A thorough exam of THC on the eyes using multiple studies to enhance impairment assessments.

WHEN
Published in 2023 with findings that are up to date.

WHERE
Published in "Addiction Biology", a peer-reviewed journal with high standards and integrity. Easy to verify.

WHY
To synthesize a myriad of Cannabis research and provide evidence of oculomotor deficits to improve road safety.

Citation
Manning B, Downey LA, Narayan A, Hayley AC. A systematic review of oculomotor deficits associated with acute and chronic cannabis use. Addiction Biology. 2024;29(1):e13359. doi:10.1111/adb.13359

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Key Takeaways

Eyelid Characteristics
Eyelid tremors are a useful indicator of recent cannabis use and are consistently observed.

Nystagmus
Sometimes increased with THC dosing, however, chronic users did not show increased nystagmus even with additional acute dosage.

Saccadic latency
Increased post-THC administration relative to placebo groups.

Conclusion
"Acute THC consumption selectively impacts oculomotor control, notably increasing saccadic latency and inaccuracy while impairing inhibitory control."

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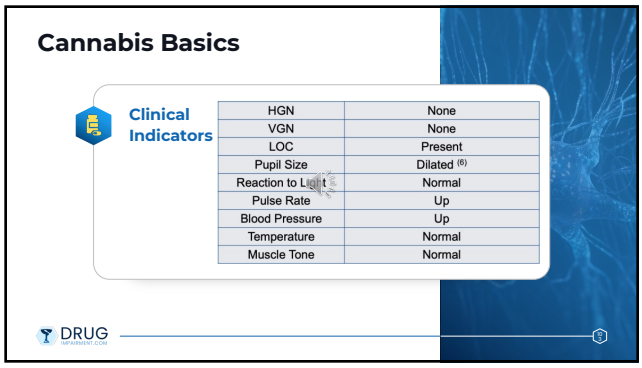
Cannabis Basics
Clinical Indicators
HGN None
VGN None
LOC Present
Pupil Size Dilated (6)
Reaction to Light Normal
Pulse Rate Up
Blood Pressure Up
Temperature Normal
Muscle Tone Normal
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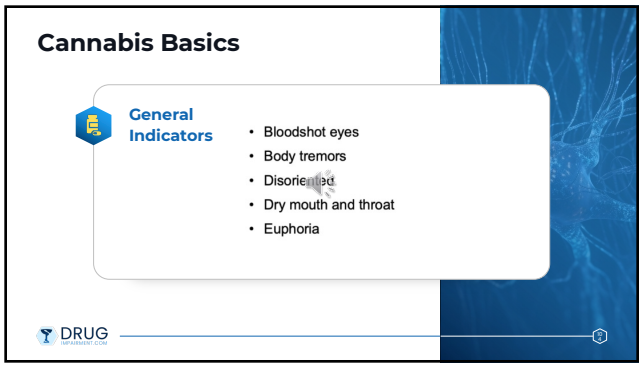
Cannabis Basics
General Indicators
Bloodshot eyes
Body tremors
Disoriented
Dry mouth and throat
Euphoria
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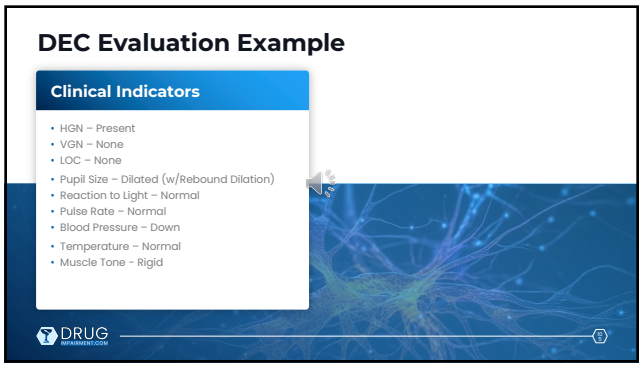
DEC Evaluation Example
Clinical Indicators
HGN – Present
VGN – None
LOC – None
Pupil Size – Dilated (w/Rebound Dilation)
Reaction to Light – Normal
Pulse Rate – Normal
Blood Pressure – Down
Temperature – Normal
Muscle Tone - Rigid
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DEC Evaluation Example

General Indicators

- Eyelid Tremors
- Droopy Eyes
- Slurred Speech
- Odor of Marijuana
- Impaired Perception of Time and Distance

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Application of Decompositional Reasoning

DRE Matrix

- HGN, VGN, LOC – Present
- Pupil Size – Dilated
- Reaction to Light – Normal
- Pulse Rate – Up
- Blood Pressure – Up
- Temperature – Normal
- Muscle Tone - Rigid

General Indicators

- Eyelid Tremors
- Droopy Eyes
- Slurred Speech
- Odor of Marijuana
- Impaired Perception of Time and Distance

	CNS DEPRESSANTS	CANNABIS
HGN	Present	None
VGN	Present (High Dose)	None
LOC	Present	Present
Pupil Size	Normal (1)	Dilated (6)
Reaction to Light	Slow	Normal
Pulse Rate	Down (2)	Up
Blood Pressure	Down	Up
Body Temperature	Normal	Normal
Muscle Tone	Flaccid	Normal
General Indicators	Disoriented Droopy eyelids Drowsiness Drunk-like behavior Impaired judgment Relaxed inhibitions Slow, sluggish reactions Thick, slurred speech Uncoordinated Unsteady walk Variety of emotional effects	Bloodshot eyes Body tremors Dissociation Drowsiness Euphoria Eyelid tremors Greenish coating on the tongue Impaired memory Impaired perception of time and distance Incomplete verbal responses Increased appetite Lack of concentration Mood changes Paranoia Rebound dilation Relaxed inhibitions Sedation

The Individual Parts

By breaking down a complex observation into simpler, more manageable parts, the officer is of the opinion that the person is under the influence of a CNS Depressant and Cannabis.

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DEC Evaluation Example

Clinical Indicators

- HGN – Present
- VGN – None
- LOC – None
- Pupil Size – Dilated (w/Rebound Dilation)
- Reaction to Light – Normal
- Pulse Rate – Normal
- Blood Pressure – Down
- Temperature – Normal
- Muscle Tone - Rigid

Clinical Indicators (Expanded)

- HGN – 4/6 clues (D&SN@MD – non-jerk)
- VGN, LOC – None
- Pupil Size – Dilated in all conditions
  - Rebound Dilation = 4.5 - 6.0 mm
- Reaction to Light – Normal
- Pulse Rate – 72, 74, 72 bpm
- Blood Pressure – 118/52
- Temperature – 99.4
- Muscle Tone - Rigid

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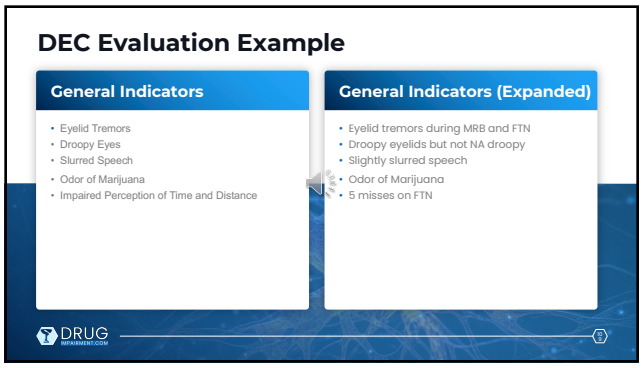
DEC Evaluation Example
General Indicators
• Eyelid Tremors
• Droopy Eyes
• Slurred Speech
• Odor of Marijuana
• Impaired Perception of Time and Distance
General Indicators (Expanded)
• Eyelid tremors during MRB and FTN
• Droopy eyelids but not NA droopy
• Slightly slurred speech
• Odor of Marijuana
• 5 misses on FTN
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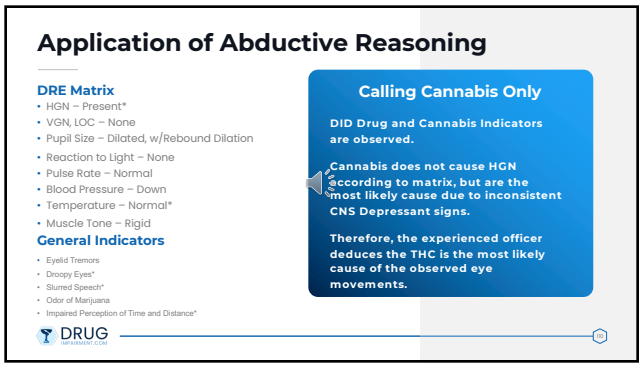
Application of Abductive Reasoning
DRE Matrix
• HGN – Present*
• VGN, LOC – None
• Pupil Size – Dilated, w/Rebound Dilation
• Reaction to Light – None
• Pulse Rate – Normal
• Blood Pressure – Down
• Temperature – Normal*
• Muscle Tone – Rigid
General Indicators
• Eyelid Tremors
• Droopy Eyes*
• Slurred Speech*
• Odor of Marijuana
• Impaired Perception of Time and Distance*
Calling Cannabis Only
DID Drug and Cannabis Indicators are observed.
Cannabis does not cause HGN according to matrix, but are the most likely cause due to inconsistent CNS Depressant signs.
Therefore, the experienced officer deduces the THC is the most likely cause of the observed eye movements.
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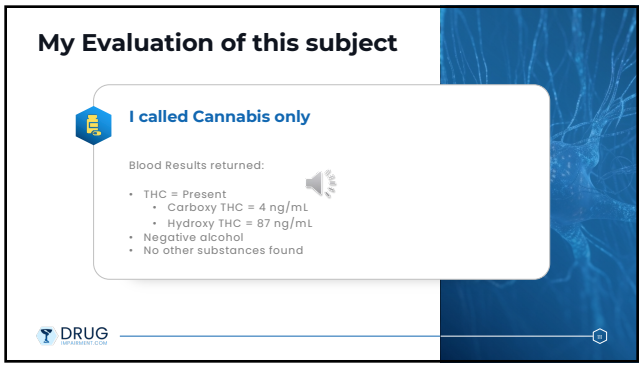
My Evaluation of this subject
I called Cannabis only
Blood Results returned:
• THC = Present
• Carboxy THC = 4 ng/mL
• Hydroxy THC = 87 ng/mL
• Negative alcohol
• No other substances found
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Key Takeaways
Types of Reasoning: Recognized different types of reasoning, such as abductive and decompositional, and their relevance in DRE evaluations.
Evaluating Credibility: Learned how to evaluate the credibility of sources using specific criteria for thorough and accurate assessments.
Applying Credibility Evaluation: Applied the credibility evaluation process to actual publications to enhance information discernment skills.
Anomalous Evaluations: Identified and accurately assessed anomalous Drug Influence Evaluations by applying foundational knowledge and experience.
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CONTACT ME
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Aaron.Botts@denvergov.org
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